Part One *Recertification*

Foreword

Each year EMT/FRs respond to, and care for, a significant number of patients who have suffered from "hard tissue injuries." (See MIRF Facts section). Therefore, this module will discuss the various types of hard tissue injuries and present a systems approach to treatment. The *SOAP* approach to prehospital care will be explained in detail. The module will conclude with *transport* and *destination* decisions.

Andre Christian Mey

Goals

Early recognition
Meaningful intervention
Safe, rapid transport to the appropriate medical facility

Objectives

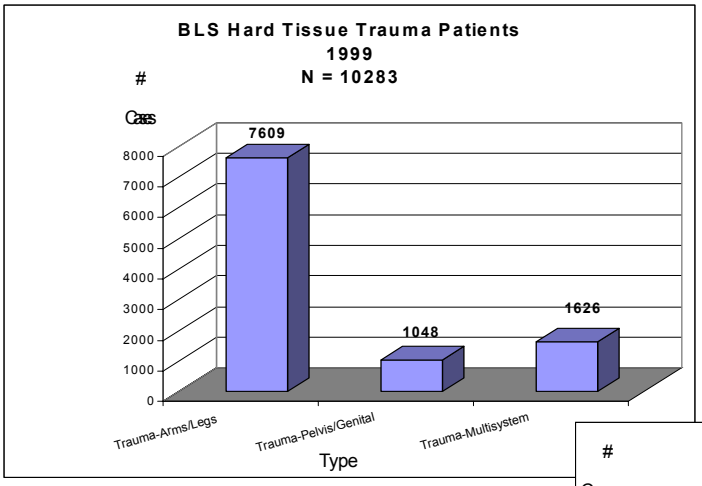
Performance Based

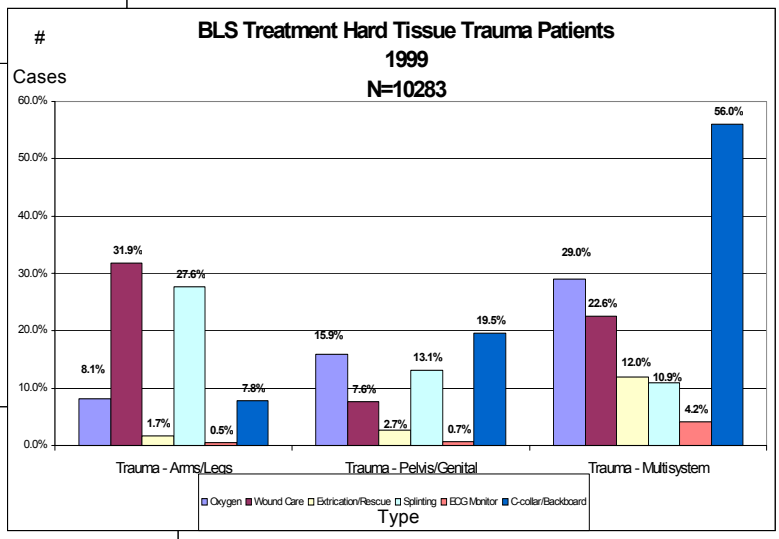
Given a partner, relevant equipment, and a patient with a hard tissue injury, the EMT/FR will demonstrate treatment as specifically identified in the King County Emergency Medical Services BLS Patient Care Guidelines.

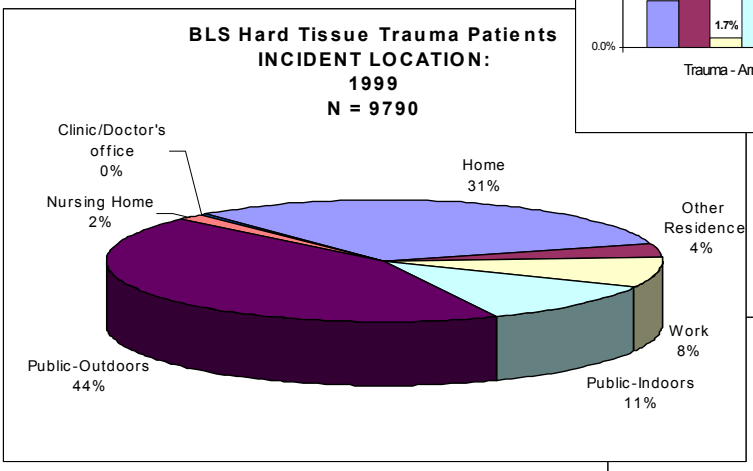
Cognitive Based

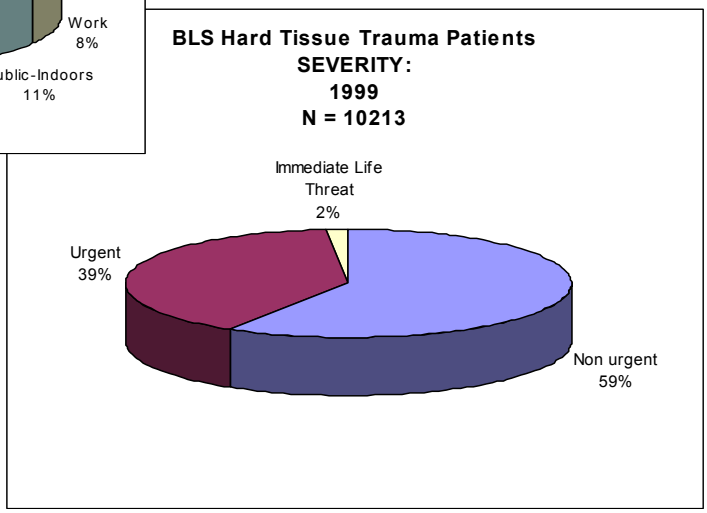
After studying the Competency Based Training (CBT) 302 Hard Tissue Injuries module, the EMT will verify cognitive learning by successfully passing a ten question written test by achieving a minimum score of 70%.

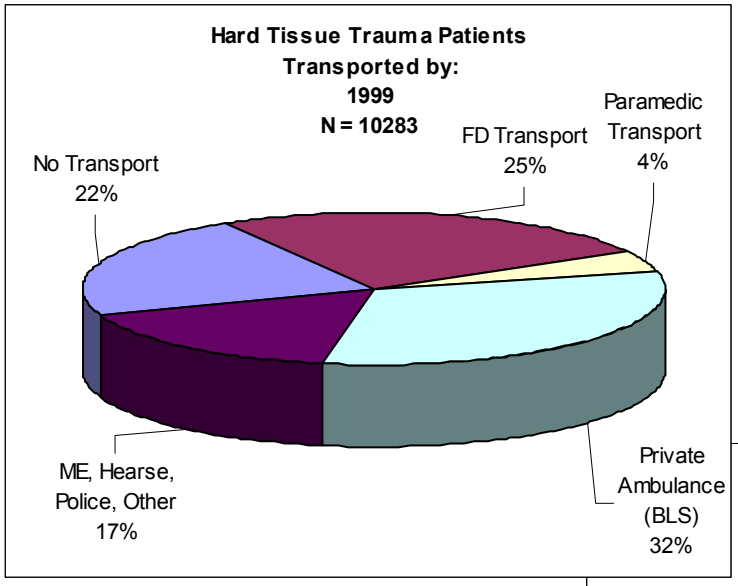
MIRF Facts

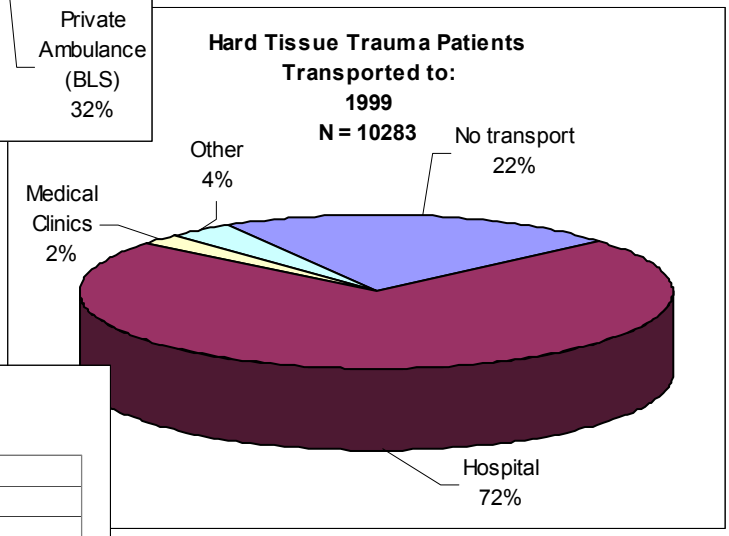

BLS Hard Tissue Trauma Patients
1999
N = 10283
#
Cases
8000
7000
6000
5000
4000
3000
2000
1000
0
7609
1048
1626
Trauma-Arms/Legs
Trauma-Pelvis/Genital
Trauma-Multisystem
Type

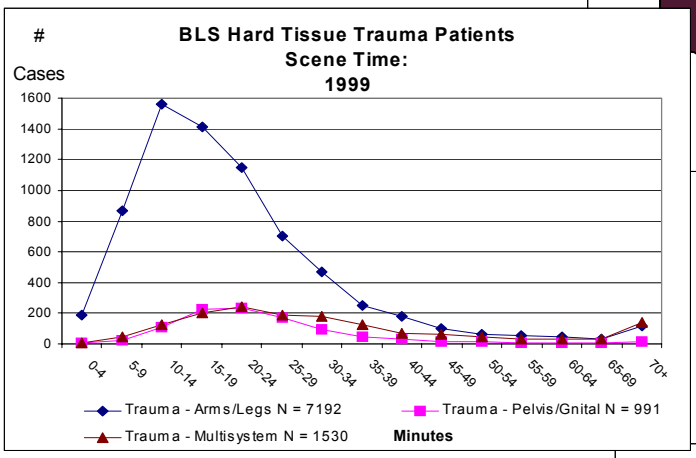

BLS Treatment Hard Tissue Trauma Patients
1999
N=10283
#
Cases
60.0%
50.0%
40.0%
30.0%
20.0%
10.0%
0.0%
8.1%
31.9%
1.7%
27.6%
0.5%
7.8%
15.9%
7.6%
2.7%
13.1%
0.7%
19.5%
29.0%
22.6%
12.0%
10.9%
4.2%
56.0%
Trauma - Arms/Legs
Trauma - Pelvis/Genital
Trauma - Multisystem
Oxygen
Wound Care
Extrication/Rescue
Splinting
ECG Monitor
C-collar/Backboard
Type

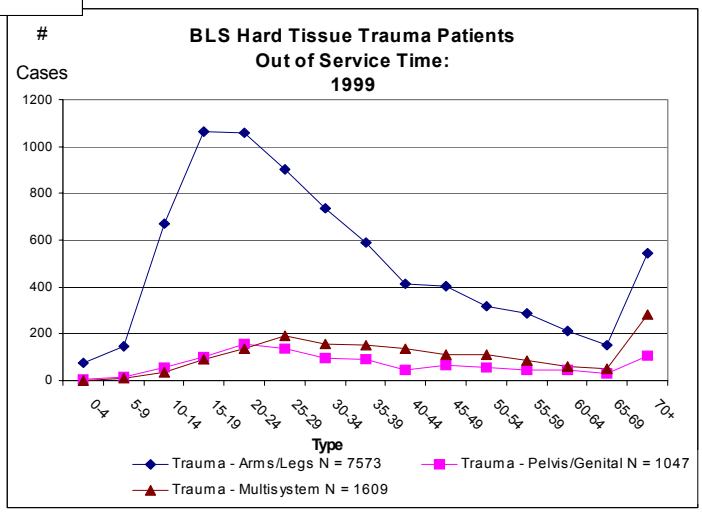

BLS Hard Tissue Trauma Patients
INCIDENT LOCATION:
1999
N = 9790
Clinic/Doctor's office 0%
Nursing Home 2%
Home 31%
Other Residence 4%
Work 8%
Public-Indoors 11%
Public-Outdoors 44%


BLS Hard Tissue Trauma Patients
SEVERITY:
1999
N = 10213
Immediate Life Threat 2%
Urgent 39%
Non urgent 59%


Hard Tissue Trauma Patients
Transported by:
1999
N = 10283
No Transport
22%
FD Transport
25%
Paramedic
Transport
4%
ME, Hearse,
Police, Other
17%
Private
Ambulance
(BLS)
32%


Hard Tissue Trauma Patients
Transported to:
1999
N = 10283
Other
4%
No transport
22%
Medical
Clinics
2%
Hospital
72%


#
Cases
BLS Hard Tissue Trauma Patients
Scene Time:
1999
1600
1400
1200
1000
800
600
400
200
0
0-4
5-9
10-14
15-19
20-24
25-29
30-34
35-39
40-44
45-49
50-54
55-59
60-64
65-69
70+
Trauma - Arms/Legs N = 7192
Trauma - Pelvis/Gnital N = 991
Trauma - Multisystem N = 1530
Minutes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Cases
BLS Hard Tissue Trauma Patients
Out of Service Time:
1999
1200
1000
800
600
400
200
0
0-4
5-9
10-14
15-19
20-24
25-29
30-34
35-39
40-44
45-49
50-54
55-59
60-64
65-69
70+
Type
Trauma - Arms/Legs N = 7573
Trauma - Pelvis/Genital N = 1047
Trauma - Multisystem N = 1609

Medical Terminology

Abrasion	loss or damage of the superficial layer of skin as a result of a body part rubbing or scraping across a rough or hard surface
Acetabulum	depression in the pelvis which the femoral head fits snugly forming the hip joint
Acromioclavicular joint	simple joint where the bony projections of the scapula and the clavicle meet at the top of the shoulder
Avulsion	injury in which soft tissue is either torn completely loose or is hang ing as a flap
Body Substance Isolation (BSI)	infection control concept and practice that assumes that all body fluids are potentially infectious
Cervical spine	portion of the spinal column consisting of the first seven vertebrae, these are the neck vertebrae
Chief complaint	reason a patient calls for help. Also the patient's response to general questions such as "what's wrong?" or "what happened?"
Clavicle	(collarbone) lateral to the sternum and anterior to the scapula (Cromion process)
Closed fracture	broken bone not protruding through the skin
Closed Injury	injury in which damage occurs beneath the skin or mucous membrane but the surface remains intact
Coagulation	formation of clots which plug openings in injured blood vessels and stops blood flow
Compartment Syndrome	elevation of pressure within the fibrous tissue that surrounds and supports muscles and neurovascular structures, characterized by extreme pain, hypesthesia (decreased pain sensation), pain on stretching of affected muscles, and decreased power; most frequently seen in fractures below the elbow or knee in children - plus severe pain

Compensated shock	early stages of shock, while the body can still compensate for blood loss or injury
Contamination	presence of infective organisms (or foreign bodies such as dirt, gravel, glass, metal) on or in objects such as dressings, water, food, needles, or a patient's wounds
Contusion	bruise without a break in the skin
Crepitus	grating or grinding sensation caused by fractured bone ends or joints rubbing together-also can be caused by rubbing of irregular cartillage tissue or scar tissue-described as crinkled cellophane
Dermis	inner layer of skin containing hair follicles, sweat glands, nerve endings, and blood vessels
Dislocation	disruption of a joint in which ligaments are damaged and the bone ends are completely displaced
Distal	structures that are farthest from the point of reference
Ecchymosis	bruising or discoloration associated with bleeding within or under the skin
Edema	presence of abnormal amounts of fluid in the extracellular spaces of body tissues, causing swelling of the affected area
Entrance wound	area of the body where a penetrating trauma occurs
Epidermis	outer layer of the skin that acts as a watertight protective covering
Exit wound	area of the body where a penetrating trauma exited
Fascia	sheet or band of tough fibrous connective tissue. It lies deep under the skin and forms an outer layer for the muscles
Femur	thigh bone extending from the pelvis to the knee, responsible for formation of the hip; the longest and largest bone in the body
Fibula Fracture	outer and smaller bone of the two bones of the lower leg break in the continuity of a bone
Greater trochanter	bony prominence on the proximal lateral side of the thigh, this is the superior lateral prominence of the femur and serves as a point of muscle attachment

Guarding	an effort to protect the injured limb
Hematoma	blood collected within the body's tissues or in a body cavity, occasionally palpable as a discrete mass
Hemorrhage	bleeding
Humerus	supporting bone of the upper arm that joins with the scapula to form the shoulder joint and with the ulna and radius to form the elbow joint
Hypotension	blood pressure that is lower than the normal range
Hypoxia	dangerous condition in which the body tissues and cells do not have enough oxygen
Iliac crest	upper rim of the pelvic bone
Infection	abnormal invasion of a host or host tissue by organisms such as bacteria, viruses, or parasites, with or without signs or symptoms of disease
Ischium	one of three bones that fuse to form the pelvic bones-this forms a ring at the inferior point of the pelvis-also known as the seat bone
Joint	is formed wherever two bones come into contact
Laceration	smooth or jagged open wound
Ligament	band of fibrous tissue joining two bones together at or in a joint
Osteoporosis	generalized degenerative bone disease common among postmenopausal women, in which there is a reduction in the amount of bone mass, leading to fractures after minimal trauma
Open fracture	broken bone protruding through the skin
Patella	kneecap

Pathological fracture	fractured bone due to a bone disease, usually cancer
Perfusion	circulation of blood within an organ or tissue in adequate amounts to meet the cells' current needs
Plantar	bottom of the foot
Point tenderness	tenderness sharply localized at the site of the injury found by gently palpating along the bone with the tip of one finger
Radius	bone on the thumb side of the forearm, most important in wrist function and supination and pronation of the forearm
Scapula	large flat triangular bone on the posterior part of the shoulder also known as the shoulder blade
Shock Position	position that has the head and torso supine and the lower extremities elevated 8 inches to 12 inches. This helps to increase blood flow to the brain; also referred to as the modified Trendelenburg position
Skeleton	framework that gives us our recognizable form. Also designed to allow motion of the body and protection of the vital organs
Sling	bandage or material that helps support the weight of an injured upper extremity
Splint	flexible or rigid appliance used to protect and maintain the position of an injured limb
Sprain	joint injury in which there is both some partial or temporary disloca tion of the bone ends and partial stretching or tearing of the supporting ligaments
Strain	muscle pull, is a stretching or tearing of the muscle, causing pain, swelling, and bruising of the soft tissue in the area
Superficial	closer to or on the skin
Swathe	bandage passing around the chest to secure an injured arm to the chest

Tendon	extension of fascia that covers all skeletal muscle connecting muscle to bone
Tibia	larger of the two leg bones responsible for supporting the major weight bearing surface of the knee and ankle; shin bone
Trendelenburg Position	position where the body is supine with the head lower than the feet, also known as the “shock position”
Ulna	bone on the small finger side of the forearm, most important for el bow function

Shock

Physiology of Perfusion

The common factor in all types of shock is inadequate *perfusion* of the various body tissues. If allowed to progress, organ failure, organ system failure, and ultimately, death will occur. The cells of the body require a constant uninterrupted supply of oxygen and other essential nutrients. These are provided by the circulatory system, in conjunction with the respiratory and gastrointestinal systems. Cells also require the elimination of waste products such as carbon dioxide and metabolic acids. Perfusion is dependent on a functioning and intact circulatory and respiratory system. The components of these two systems are:

- **The pump (heart)**
- **The volume (blood)**
- **The container (blood vessels)**
- **The filters (lungs, kidneys and liver)**

Trauma may impact any or all of these components, which reduces *perfusion* and results in shock.

Causes of acute shock with hard tissue injury

- **Fluid loss**
- **Heart failure**
- **Spinal cord injury**

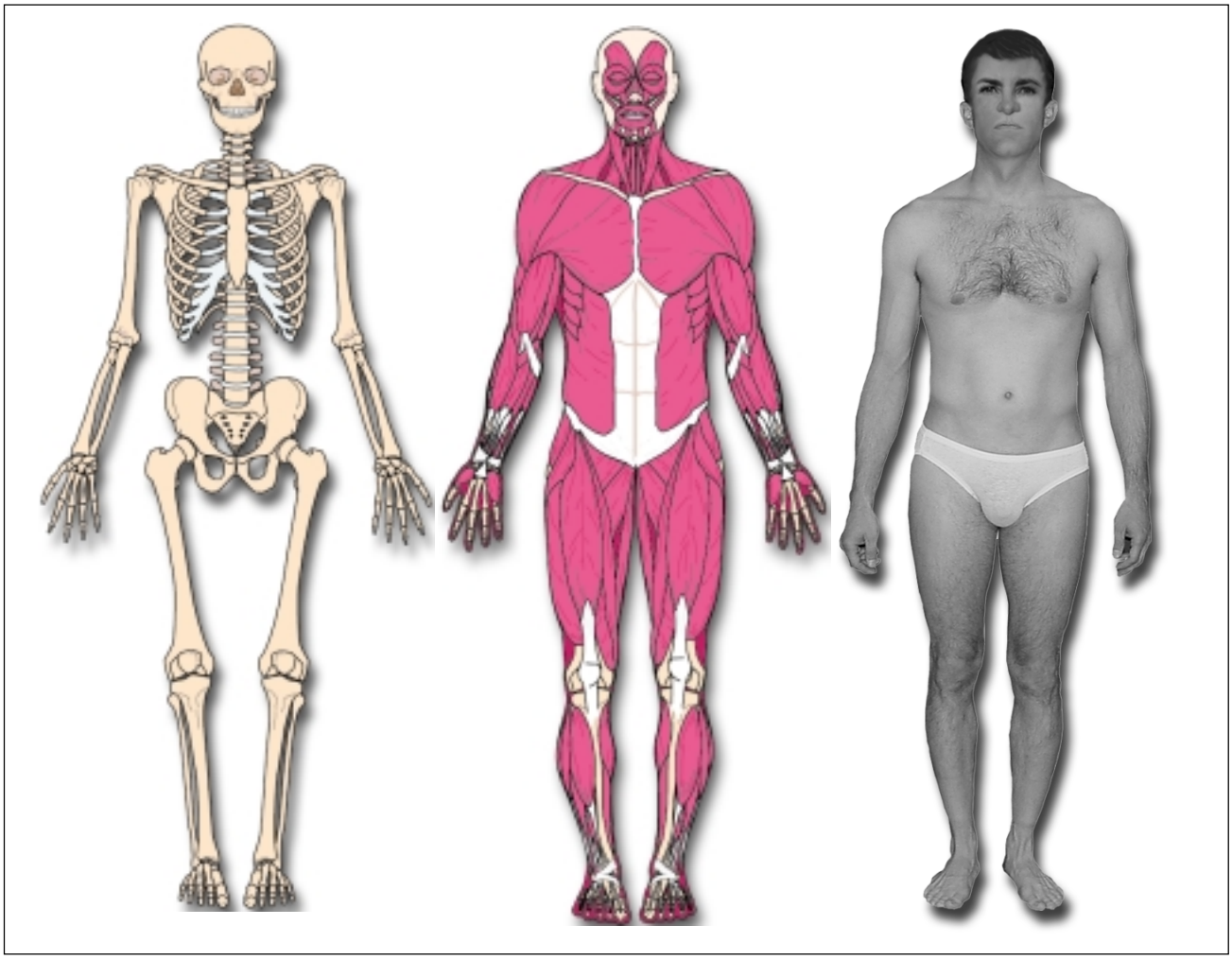
Although the causes are different, all forms of shock have the same underlying pathology at the tissue level.

STAGES OF SHOCK

1. Mechanism
↓
2. Injury
↓
3. Fracture/s
↓
4. Vessel damage
↓
5. Blood loss
↓
6. Hypotension (Low **B**lood **P**ressure)

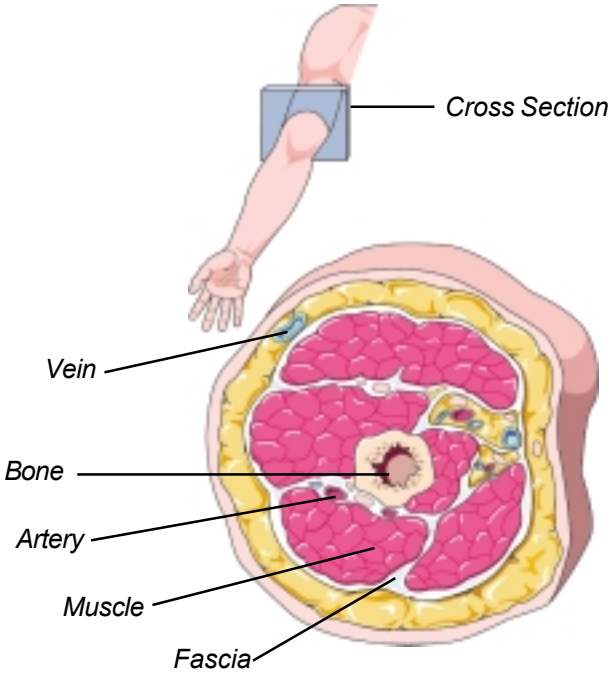
Anatomy

For the purposes of CBT 302, hard tissue injuries are any injuries that involve the skeleton, skeletal muscles, tendons, joints, ligaments, and articular cartilage. The *skeleton*, which gives us our recognizable human form, protects our vital internal organs and allows us to move. It is made up of approximately 206 bones. The bones produce blood cells (in the bone marrow) and serve as a reservoir for important minerals and *electrolytes*.

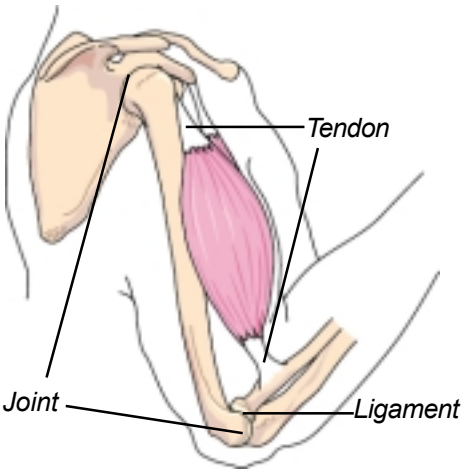


Skeletal muscle, also called striated muscle because of its characteristic stripes, attaches to the bones and usually crosses at least one joint. Skeletal muscles are also called voluntary muscles because they are under direct voluntary control of the brain. Movement is the result of several muscles contracting and relaxing simultaneously.

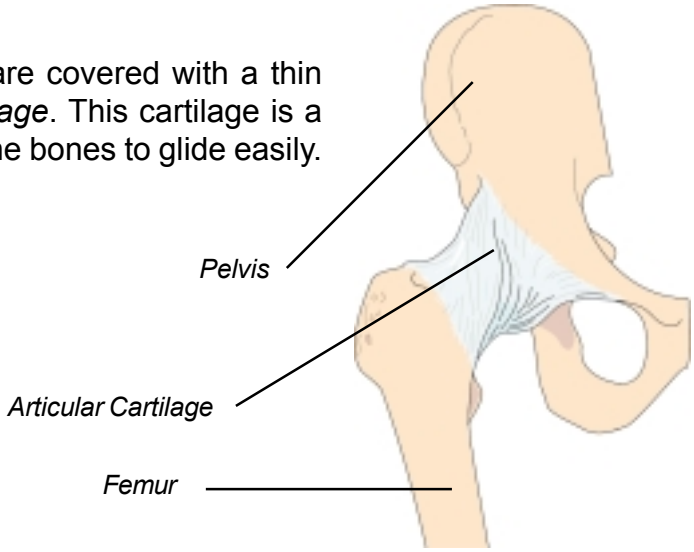
All skeletal muscles are supplied with arteries, veins, and nerves. Muscle tissue is directly attached to the bone by tough, rope-like fibrous structures known as *tendons*, which are extensions of the fascia that covers all skeletal muscle.



A *joint* is formed whenever two bones come into contact. Joints are held together in a tough fibrous structure known as a capsule, which is supported and strengthened in certain key areas by bands of fibrous tissue called *ligaments*.



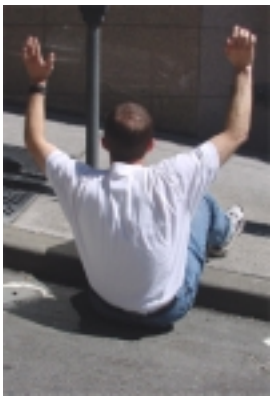
In moving joints, the ends of the bones are covered with a thin layer of cartilage known as *articular cartilage*. This cartilage is a pearly substance that allows the ends of the bones to glide easily.



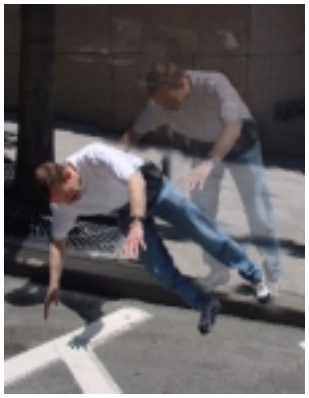
Hard Tissue Injuries

Significant force is usually required to cause a fracture or dislocation. The types of forces (mechanism of injury) applied to the limbs that can cause fractures are:

1. Direct (fracture results at the point of impact)
2. Indirect (fracture results at a distant point)
3. Twisting (tearing or shearing of ligament)
4. High-energy (speed, height, projectiles and/or other extreme force)



1



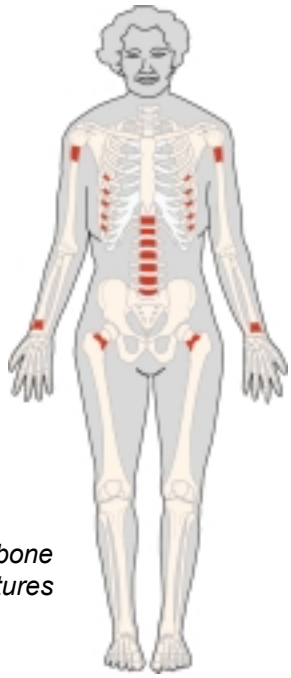
2

3

4

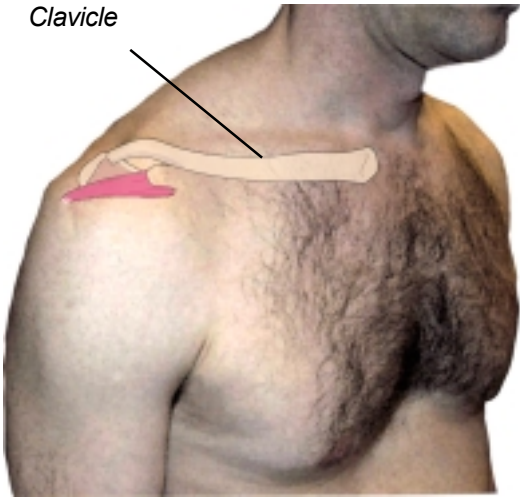
Mechanism of Injury

Extreme force or transfer of energy is not always necessary to fracture a bone. A slight force can easily fracture a bone that is weakened by a tumor or *osteoporosis*. In geriatric patients with osteoporosis who experience minor falls, simple twisting injuries, or even a muscle contraction can cause a fracture.

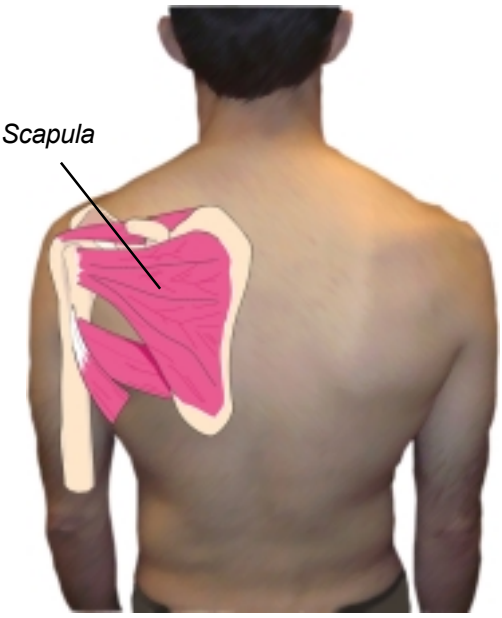


Common areas of weakened bone susceptible to pathologic fractures

1. Clavicle & Scapula



The *clavicle*, also called the collarbone, is one of the most commonly fractured bones. The patient with a fractured collarbone will complain of pain in the shoulder and attempt to guard the injured shoulder by holding the arm across the front of their body. The patient will be unwilling and unable to use the arm of the injured shoulder due the intense pain caused from the fracture. This makes it difficult for the EMT/FR to assess the type of injury. However, pain, swelling, and point tenderness over the clavicle are generally considered as reliable signs and symptoms of a fractured clavicle. The clavicle is subcutaneous (just beneath the skin) and when traumatized, will "tent" over the fracture site. It is important to know and remember that the clavicle is positioned over major arteries, veins and nerves, and when fractured could cause neuromuscular damage.



The *scapula*, also called the shoulder blade, is less often injured or fractured due to its position and protection by the large muscles. Fractures of the scapula are usually the result of forceful and direct trauma to the back. Sometimes this type of injury can include injuries to the chest cavity and its contents (heart and lungs). Therefore, the EMT/FR should always listen for lung sounds and assess the movement of air to establish the patient's ability to breathe.

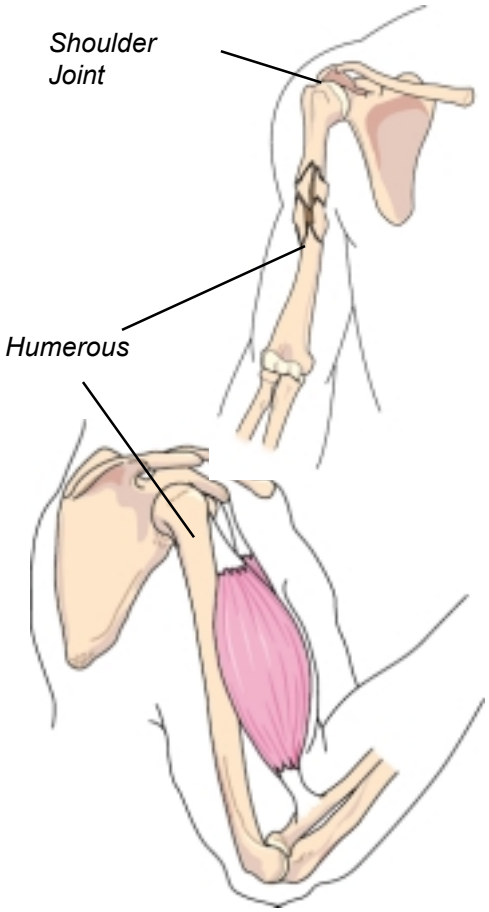
2. Sh*oulder*

The *shoulder* joint (glenohumeral joint) is the junction between the humerus (supporting bone of the upper arm) and the scapula (glenoid fossa). It is the most commonly dislocated joint in the body. Usually, the humeral head will dislocate anteriorly, and land up in front of the ribs as a result of forced abduction (away from the midline) and external rotation of the arm. As you can imagine, a shoulder dislocation is extremely painful. The patient will aggressively guard their injured shoulder by keeping the dislocated arm in a still position away from the chest. The shoulder will be locked in position. The humeral head will protrude anteriorly underneath the pectoris major on the anterior chest wall. Sometimes, the axillary nerve may be compressed, causing numbness on the outer aspect of the shoulder and in some patients, the hand may feel numb because either the nerves or the circulation is compromised.

Dislocation of the shoulder affects the supporting ligaments of the anterior aspect of the shoulder. Often these ligaments fail to heal adequately, causing dislocation to reoccur and further neuromuscular damage. In severe cases surgical intervention is necessary. Some patients reduce their own dislocated shoulders. Reducing a patient's dislocated shoulder is not within the EMT/FR's scope of practice.

3. Humerus

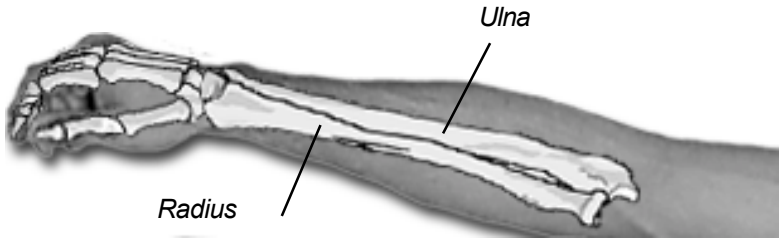
Fractures of the *humerus* take place proximally, in the midshaft, or distally at the elbow. Fractures of the proximal humerus after falls are common in the geriatric population. Fractures of the midshaft are more synonymous in the young, most often after direct force trauma. Children who sustain forearm (humerus) fractures can develop compartment syndrome.



4. Elbow & Forearm

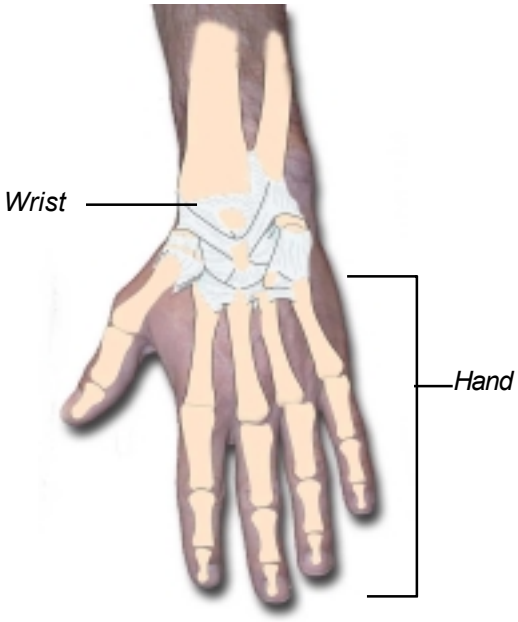
Fractures and dislocations around the *elbow* are common. Limb deformities are usually present. Because injury to blood vessels and nerves are likely, excessive manipulation or movement must be limited. This type of injury is common during sporting activities or falls. The ulna and radius are displaced posteriorly. The ulna and the radius bones both join the distal humerus. The posterior displacement makes the olecranon process of the ulna much more prominent. The joint is usually locked, with the forearm moderately flexed on the arm; this position makes any attempt at motion extremely painful. There is swelling, significant pain and possible vessel and nerve injury.

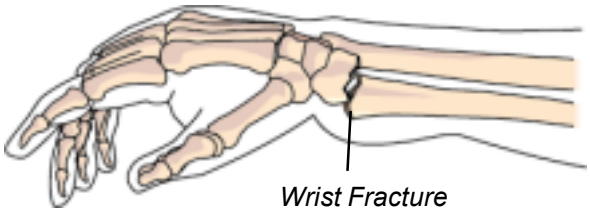
Fractures of the *forearm* (radius and ulna) are common among all age groups, most often in children. Usually, both bones break simultaneously when the hand is stretched out as the child tries to break their fall. In direct trauma, only one bone, either the radius or ulna may fracture, (which contrasts both bones in falls). Fractures of the distal radius are sometimes called Colles fractures. A "silver fork fracture" is often used to describe the shape of the arm after the fracture has occurred. One concern in children is that this type of fracture can occur in the growth plate and cause future complications.



5. Wrist & Hand

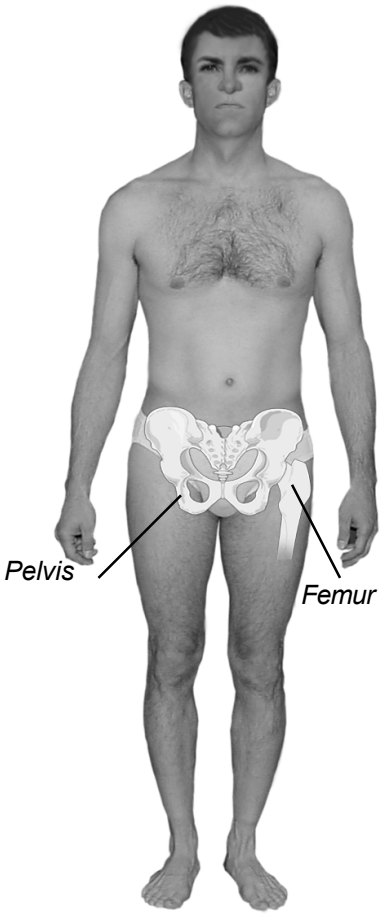
Trauma to the wrist (fractures, dislocations and sprains) must be confirmed with X-ray. A common wrist injury is the isolated, nondisplaced fracture of a carpal bone, typically the scaphoid. All suspected wrist injuries should be splinted and evaluated by a physician. On the job, sporting and domestic accidents usually result in dislocations, fractures, lacerations, burns and sometimes amputations.



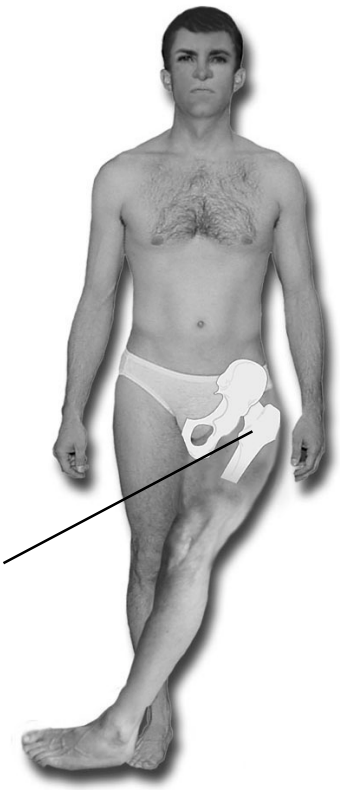


6. Pelvis & Hip

Direct compression injuries sufficient to cause the *pelvis* to fracture are often serious and life threatening. Motor vehicle accidents and falls from any height, (especially in the geriatric population) are mechanisms that produce fractures of the pelvis and/or femur. Sometimes an indirect force is transferred along the femur, and the hip causing pelvic fractures. The pelvis seldom breaks in one place! Because major blood vessels located in the pelvic cavity are susceptible to further injury, fractures of the pelvis should be splinted and immobilized as quickly as possible to prevent further blood loss. Remember, visible signs of shock are not always present until severe blood volume is lost.



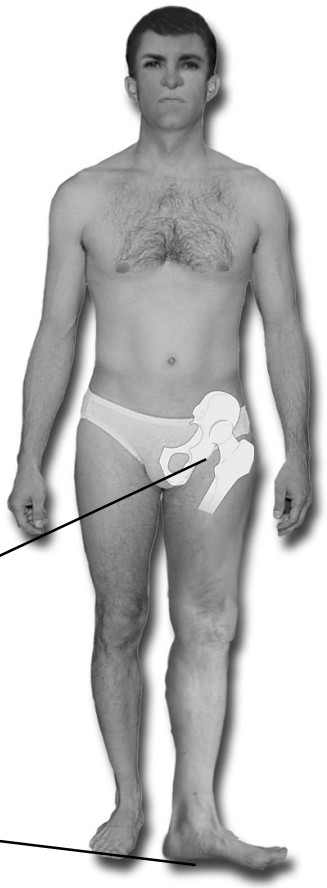
7. The *hip joint* is a very stable ball-and-socket joint that dislocates only after significant force is applied. Most dislocations of the hip are posterior. The femoral head is displaced posteriorly to lie in the muscles of the buttock. Most dislocations occur during motor vehicle accidents in which the knee meets with a direct force and the femur is driven posteriorly. Posterior dislocation of the hip is frequently complicated by injury to the *sciatic* nerve located directly behind the hip joint. The sciatic nerve controls the activity of the muscles in the thigh and below the knee, as well as sensation in the entire leg or foot. When this nerve is compressed or stretched, partial or complete paralysis of this area may occur. Patients with posterior dislocation of the hip lie with the hip joint flexed and the thigh rotated inward toward the midline of the body over the top of the opposite thigh.



Posterior hip dislocation
shortened, internal rotation
(For the purpose of illustration)

Normal hip placement

With the rare anterior dislocation, the limb is in the opposite position, extended straight out, rotated, and pointing away from the midline of the body. The patient will complain of severe pain in the hip and resist any attempt to move it. As with all other dislocations no attempt should be made in the field to reduce a dislocated hip.

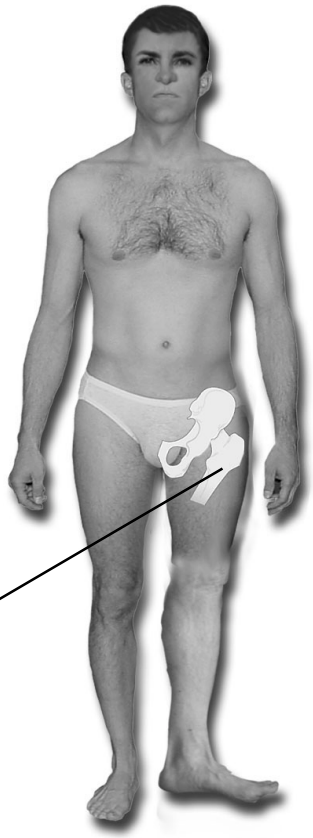


Anterior hip
dislocation

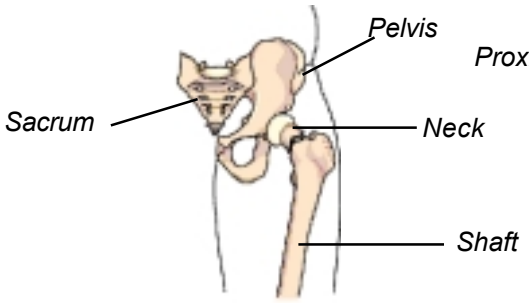
Lengthened, external rotation
(For the purpose of illustration)

8. Femur (Proximal End & Shaft)

Fractures of the *proximal* (upper) femur are among the most common fractures, especially in the geriatric population. The break usually occurs at the neck or across the proximal shaft of the femur.



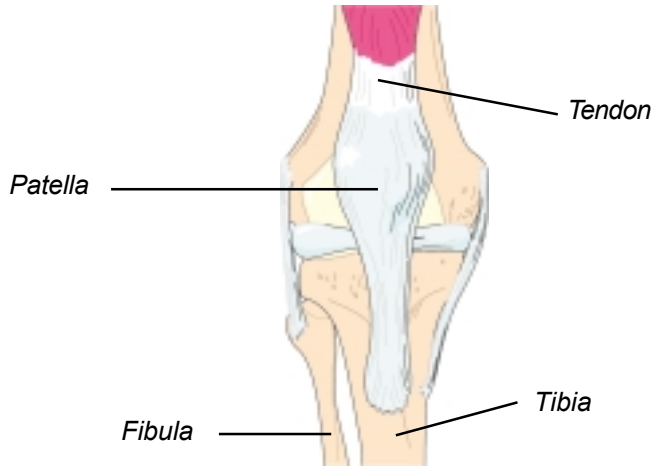
Patients with displaced fractures of the proximal end display a very characteristic deformity. They lie with the leg externally rotated, and the injured leg is usually shorter than the opposite, uninjured limb. When the fracture is not displaced, this deformity is not present. Fractures of the femur make it near impossible for the patients to walk or move the leg because of the pain. Patients with femur (hip) fractures lose significant amounts of blood into the area of the fracture (except for elderly hip fractures). Therefore, EMT/FRs should constantly monitor the vital signs for shock and treat accordingly.

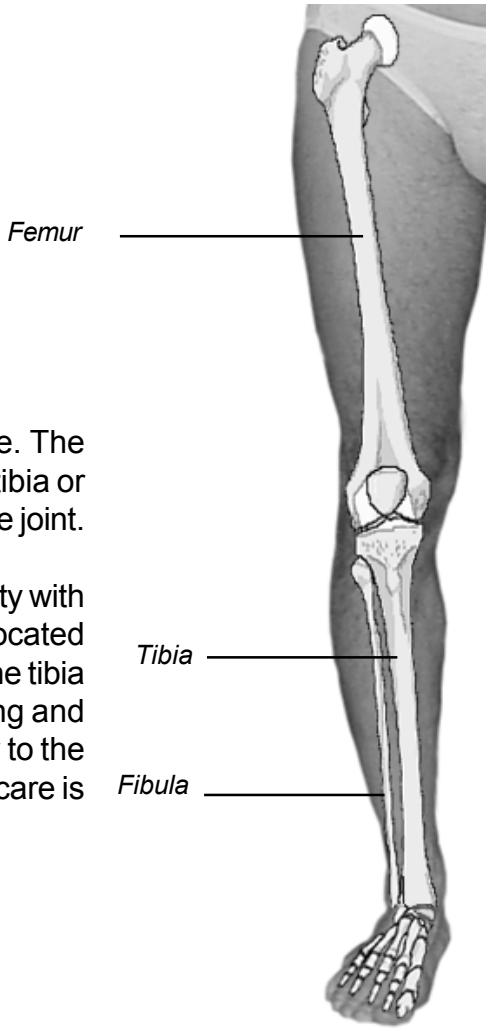


Fractures of the femur also occur in other parts of the bone, for example the *shaft*, and the femoral condyles just above the knee joint. Post fracture of the femur, the large muscles of the thigh spasm in an attempt to “splint “ the unsupported limb. Sometimes these muscle spasms cause shortening and deformity of the limb, with severe angulation or external rotation at the fracture site. These types of fractures are often open fractures (with bones protruding through the skin). Significant amounts of blood may be lost, sometimes as much as 1000 ml, often resulting in hypovolemic shock. In addition bone fragments and deformity often damage important nerves and vessels which may have long lasting effects and retard recovery. It is important to provide constant distal neurovascular function monitoring and rapid transport to a hospital emergency room.

9. Knee & Patella

Because of its anatomical location the *knee* is extremely vulnerable to injury. A variety of injuries can and do occur in the knees. Injuries to the ligaments of the knee range from mild sprains to complete dislocation and/or tear. The patella (kneecap) is also susceptible to injury. When abnormal bending or twisting forces are applied to the knee joint as seen in competitive sporting events, injuries to the ligaments are increased.



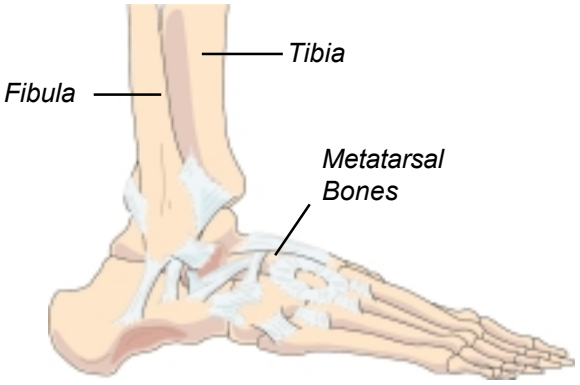


10. Tibia & Fibula

The *tibia* is the largest of the two leg bones below the knee. The *fibula* is the smaller of the two. Fractures of the shaft of the tibia or the fibula may occur at any place between the knee and ankle joint.

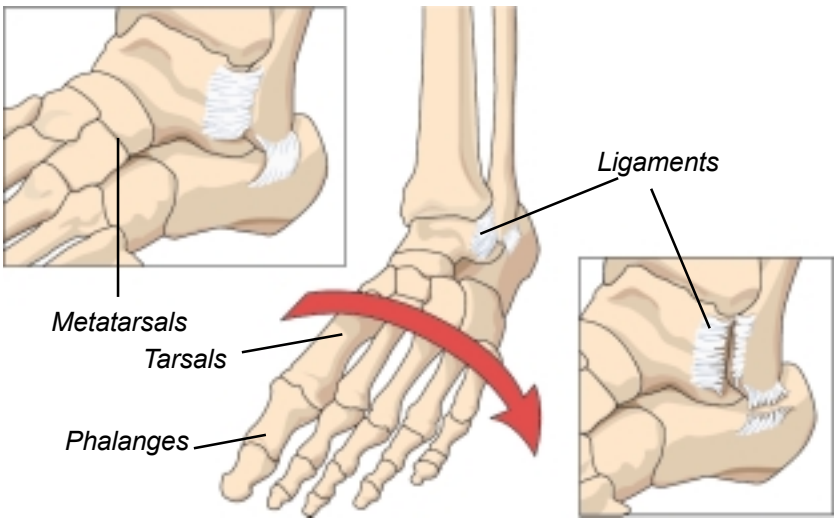
Mid-shaft fractures of the tibia usually result in gross deformity with significant angulation or rotation. Because both bones are located close to the skin, open fractures are common. Fractures of the tibia and fibula are often associated with vascular injury. Splinting and realigning the limb frequently restores adequate blood flow to the foot. As with any fracture, prompt physician evaluation and care is necessary.

11. Ankle & Foot



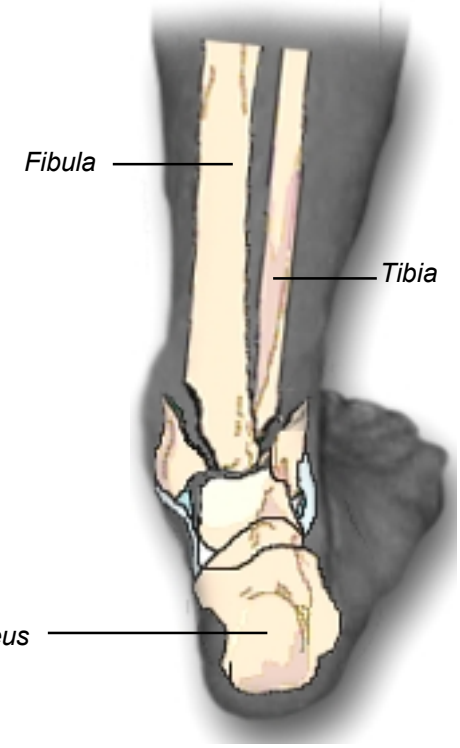
The *ankle* is the most commonly injured joint. Ankle injuries range from simple sprains, which heal after several days, to severe fracture-dislocations that require physician intervention. As with all joint injuries, sometimes it is difficult to tell a nondisplaced ankle fracture from a simple sprain without X-rays. Therefore, ankle injuries that produce pain, swelling, localized tenderness, or the inability to bear weight must be evaluated by a physician. Twisting is usually the mechanism of injury. This causes stretching and sometimes tearing of the supporting ligaments. Extensive twisting may result in fracture of both malleoli. Dislocation of the ankle is usually associated with fractures of the malleoli.

Injuries of the *foot* often result in the fracture of one or more of the tarsal, metatarsals, or phalanges of the toes. Toe fractures are extremely common. Of the tarsal bones, the calcaneus (heel bone) is the most frequently fractured. Injury usually occurs when the patient falls or jumps from height and lands directly on the heel. The force of the injury compresses the calcaneus, producing immediate pain, swelling and ecchymosis. If the force of impact is great, there may be other fractures as well. Injuries of the foot result in swelling but rarely is gross deformity seen. Vascular injuries are not common.



Twisting Injuries

Ankle Fracture



Subjective

History

A SYSTEMATIC APPROACH TO PATIENT CARE

The overall goal is *early recognition*, *meaningful intervention*, and *safe, rapid transport* to the appropriate medical facility. During the scene size up, carefully observe the patient's position (supine, prone, lateral recumbent) and demeanor, (calm or anxious). The patient's position and demeanor may provide valuable clues about the mechanism of injury. However, sometimes this can be misleading. For example, people who walk away from motor vehicle accidents are not necessarily injury free. When in doubt, always adopt the most conservative approach.
Body Substance Isolation (BSI) is required. Quickly establish a rapport with your patient by introducing yourself and obtain consent to treat. Reassure the patient, ask them what happened (mechanism), and listen carefully to their reply.

The standard **SAMPLE** format of questioning should follow:
Symptoms

> **O**nset, what and when did it happen?
> **P**rovoke, Mechanism, what causes the pain to increase?
> **Q**uality, describe the type of pain
> **R**adiate, does the pain move around?
> **S**everity, rate the pain from one to ten?
> **T**ime, how long does the pain last?

Allergies
Medications
Past History=comorbidity
Last Oral Intake
Events Leading Up To Incident

<u>Symptoms of Hard Tissue Injuries:</u>

- Injury, chief complaint ("I fell and heard my leg break")
- Anxiety and concern
- Pain with or without movement
- Nausea/vomiting
- Immobility
- Decrease or loss of sensation/circulation

<u>Important information to find out regarding mechanism of injury</u>

- Force and speed involved
- Were safety precautions taken (Helmets, harnesses, airbags etc…)
- Height fallen
- Caliber of projectile (during the exam, check for exit wounds)
- Length of penetrating object
- Direction of twist
- Sounds heard

Objective

Physical Exam

The physical exam is systematic and focused on the patient's chief complaint. When time permits, perform a more detailed exam that includes both the patient's front and back. Measure and document ***baseline vital signs*** and follow up with a second set at the end of the detailed physical exam. Unlike the subjective element of patient care, the objective element focuses on what *you* observe during the exam. Usually, the physical exam findings
correspond with the chief complaint.

Signs of hard tissue injuries include:

- Mechanism of injury
- Swelling
- Pain and tenderness
- Bleeding
- Limited movement
- Deformity (compare to uninjured hard tissue)
- Crepitus
- Absence of distal pulses, motor function and sensation
- Shock (cool, pale and clammy skin, rapid pulse, anxiety
- Associated soft tissue injury, lacerations, abrasions, and hematomas

Evaluating neuromuscular function (CMS)
Important blood vessels and nerves lie close to the bone, especially around the major joints. Assess neuromuscular function during the detailed exam. Repeat every five to ten minutes.

Circulation, palpate the pulses distal to the point of injury
Motor function, evaluate muscular activity
Sensation, check for feeling and the patient's ability to sense light touch

Student Notes	***Instructor Ideas***

Assessment

Impression

Emergency Medical Technicians are trained to deliver Basic Life Support (BLS). The information gathered by the EMT/FR regarding the patient's chief complaint (subjective) and physical exam (objective), allow the BLS Team to make an assessment or impression that leads to a treatment plan.

Before requesting a Medic response, consider whether Advanced Life Support (ALS) intervention will improve the patient's condition/outcome. Do you and your partner think that the Medic's judgment or procedures (Intubation, IV's, or Drugs) will help the patient?

ALS Indicators (Sick)

- Major Mechanism of Injury
- Altered Level of Consciousness or unconscious
- Compromised airway
- Paresis and/or Parenthesis
- Unstable Vital Signs
- Hypotension (BP < 90 systolic))

BLS Indicators (Not Sick)

- Minor Mechanism of Injury
- Intact airway
- Stable vital signs
- Normal blood pressure
- No evidence of injury to brain or spinal cord

Student Notes	***Instructor Ideas***

Plan

Treatment

A SYSTEMATIC APPROACH TO PATIENT CARE

Most patients with hard tissue injuries can be managed by the EMT/FRs in the field without Advanced Life Support intervention.

Management

- **Request Medics (ALS Indicators)**
- Protect cervical spine (consider MOI)
- Reassure and keep patient warm
- Apply direct pressure and sterile dressing over bleeding wound/s
- Oxygen therapy as appropriate
- Nothing by mouth
- Gently support injured part
- Allow patient to choose position of comfort
- Check and record distal CMS
- Apply cold/ice pack to injured part (for closed tissue injury only)
- Gentle traction to mid-shaft femur fracture
- Immobilize and elevate fracture with appropriate splint, sling & swathe
- Prepare “Aid Car” temperature 70? F
- Prepare patient for transport (backboard, scoop stretcher)
- Monitor patient’s vital signs every 5-10 minutes

See Appendix at the end of this module for treatment & destination decisions

Student Notes	***Instructor Ideas***

APPENDIX A

TRANSPORTATION DECISIONS

1. Leave at scene

Minor injury with little or no potential for patient to worsen
BLS Indicators
EMT feels confident that patient is responsible for self-care, or that another respon sible party is present
EMT urges patient to call back if further concerns or problems arise
EMT reminds patient to follow up with private MD if appropriate
Patient refusal signed ONLY if: a) EMT believes patient SHOULD go to medical facility and b) patient refuses treatment/transportation

Most patients with hard tissue injury will require transport!

2. Patient's Own Vehicle (POV)

BLS Indicators
Further evaluation or treatment needed
Responsible transportation is available, transport must maintain splinting and other BLS measures

3. BLS Aid Car/Private Ambulance

BLS Indicators
Continued BLS assessment, oxygen or other treatment needed en route
No other responsible transport available
Patient requires stretcher for transport

4. ALS

ALS Indicators
Continued ALS assessment or treatment needed during transport

Destinations Decisions

1. Self-care

Minor injury with little or no potential for patient to worsen

BLS Indicators

EMT feels confident that patient is responsible for self-care, or that another resposible party is present

EMT urges patient to call back if further concerns or problems

EMT reminds patient to follow up with private MD if appropriate

Patient refusal signed ONLY if a) EMT believes patient SHOULD go to medical facility and b) patient refuses treatment/transportation

Most hard tissue injuries will not respond to self care

2. Clinic or Doctor's office

Minor injury with little or no immediate portntial for patient's condition to worsen

BLS Indicators

Need for further evaluation and treatment

Facility is available and capable of assessing and treating the patient, patients with hard tissue injury will require an x-ray for diagnosis

Facility agrees to see patient

Patient has transportation to and from the facility considered

3. Hospital Emergency Room

Major or minor injury with need for further medical evaluation and treatment

LS or BLS indicators

Nor other facility appropriate or available to see patient

Consider specific facilities for specific conditions (e.g. Level I Trauma, Level III/IV Trauma, Pediatric Center)

Learning References and Resources

AAOS Emergency Care and Transportation of the Sick and Injured (7th Edition)
KCEMS BLS Patient Care Guidelines